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**ADVANCED DISTRIBUTED LEARNING  
SURVEY RESULTS: 2004 REPORT**

**A PUBLICATION BY**

**THE NATO TRAINING GROUP  
WORKING GROUP ON  
INDIVIDUAL TRAINING  
AND  
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**PREFACE**

1. The NATO Training Group Joint Services Sub-Group established the Working Group on Training Technology in 1971 to foster the development and application of training technology within the armed forces of the members of the Alliance. The Working Group is now normally known by its title: The NATO Training Group Working Group on Individual Training and Education Developments, abbreviated as NTG WG/IT&ED. Included in the Working Group's terms of reference are responsibilities for promoting a common understanding of training philosophies and terminology, exchanging information on applications of training technology, and reporting on the success of innovations.
2. Because of its experience in the field of training and education, the Working Group was tasked by the NATO Military Committee to analyze and document NATO and PfP requirements for Advanced Distributed Learning intended to enhance NATO operational effectiveness through education, training, simulation, and performance aiding. This tasking requires the NTG WG/IT&ED to provide the NATO Military Committee with an annual report on these matters. The NTG WG/IT&ED has been able to submit these reports on a two year rather than yearly basis. This is the second survey report submitted to the NTG through its Joint Service Sub-Group (JSSG).
3. The NTG WG/IT&ED produces two types of documents: Publications and Papers. Papers are documents covering a topic formally agreed by the Working Group, but each has been written by an individual national delegation and may therefore reflect purely national perceptions. Publications are formally agreed NTG WG/IT&ED documents and represent the combined view of all delegates.
4. This document is a publication issued {{DATE??}}.

**Advanced Distributed Learning Survey Results:**  
**2004 Report**

**THE ADL INITIATIVE**

1. Advanced Distributed Learning (ADL) is the latest initiative in a long campaign to secure the advantages of instructional technology and simulation for military education and training. ADL means different things to different people. It is implemented in different ways by different military (and civilian) organizations. However, it has a defining, common core, which is to make education, training, and performance aiding available anytime and anywhere they are needed – in classrooms, in garrison, or in the field. ADL is intended for use by individuals or by groups such as teams, crews, and command staffs. It accomplishes these ends by applying instructional technology such as computer-based instruction, interactive multimedia instruction, intelligent tutoring systems, networked simulation, electronic performance support systems, and web-based instruction.

2. ADL is motivated by findings from many empirical studies that began in the 1960s on the effectiveness and cost benefits of these technologies. In aggregate, these studies have found that, compared to techniques currently used in military education and training, ADL technologies reduce the costs of instruction by about a third and, additionally, either increase knowledge and skill attained by about a third (holding time to learn constant) or reduce time to learn (holding thresholds of knowledge and skills constant) by a third (Wisher & Fletcher, 2004). Studies concerned with decision and performance aiding produce similar results. They have found that ADL technologies allow less skilled individuals to perform as well as highly skilled and trained individuals thereby enhancing readiness and operational effectiveness while substantially reducing costs for both training and task accomplishment (Fletcher and Johnston, 2004). These studies suggest that ADL technologies achieve these effects by tailoring instruction and performance aiding to the needs, intentions, and capabilities of the user, by increasing the intensity of interaction (e.g., the amount of computer-user ‘give and take’ per unit time), and by adjusting the pace of instruction or performance aiding to allow individuals or groups of users to progress as quickly or as slowly as needed.

3. The ADL initiative goes beyond the core objective of making learning and performance aiding available anytime and anywhere. It is also attempting to reduce costs of to develop instructional and performance aiding content and to advance the state of the art and practice in their delivery. It prepares for a future in which ready-made components (i.e., instructional objects) are accessed from the World Wide Web, assembled in real time, and tailored specifically to the immediate needs of learners or decision makers (Dodds & Fletcher, in press). This capability will also substantially enhance the efficiency with which ready-made materials can be assembled for delivery on mass memory devices such as CD-ROMs. All these goals rely on the development of sharable components that are distributed by the World Wide Web.

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4. Presently the ADL initiative identifies these sharable components, or objects, as ‘sharable content objects’. Specification of these objects is a cornerstone of ADL development. They are intended to be accessible (easily found and retrieved when needed), interoperable (usable on nearly all client systems), durable despite modifications in the underlying client system software and operating systems, and reusable across a variety of applications. The ADL initiative is intended to provide a basis for what has been called an instructional object economy (Spohrer, Summer, and Shum, 1998). In such an economy, competitive advantage is gained as much by assembling ready-made sharable objects into meaningful interactions as by creating the objects in the first place. Although ADL objects are called instructional objects they might just as commonly be used in simulations thereby supporting a simulation object economy as well as an instructional object economy (Wiley, 2000). Specifications for developing these objects are documented in an evolving series of references called the Sharable Content Object Reference Model (SCORM). Current versions of SCORM can be retrieved from the Web at <http://www.adlnet.org>.

**NATO SURVEY TASKING**

5. The NATO Training Group (NTG) has worked since 1973 to improve the quality of NATO training and education through multinational cooperation and resource sharing. During the past decade this cooperation has been extended to the Partners for Peace (PfP) nations. The ADL initiative can significantly enhance cooperation among NATO and PfP countries through its development of easily accessed, distributed, and interoperable information, data, and instructional objects. ADL technologies and the rapidly emerging SCORM specification are now sufficiently mature to support this interchange and its implementation.

6. Because of the substantial promise of ADL and SCORM for enhancing NATO education, training, simulation, and operational effectiveness, the NATO Military Committee requested the NTG WG/IT&ED to analyze and document NATO and PfP requirements for ADL in these areas. This tasking includes identification of current and emerging needs, priorities, and capabilities. The tasking requires the WG/IT&ED to report on these matters to the Military Committee through the Joint Services Sub-Group (JSSG) and the International Military Staff.

7. This tasking, was established by the NATO Training Group (NTG) Memorandum NTG-033-01, dated 5 June 2001. It is included here as Enclosure 1. It specifies the formal terms of reference for these reports. This WG/IT&ED publication is intended as the second submission in response the NTG tasking.

**THE 2001 “QUICK LOOK” SURVEY**

8. In 2001, the WG/IT&ED prepared and administered a “Quick Look” Survey in response to the NTG tasking (WG/IT&ED, 2002). The survey was intended to provide as much initial information as possible in the time available. Responses to this Survey were obtained from 25 countries.

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9. Overall conclusions from the Quick Survey were the following:

- There was general agreement on five high-priority areas for ADL development and delivery. English Language for NATO Terminology was rated as most important, followed in order by Practice of Staff Procedures, Command and Control Operations, Staff Officer and NCO Training for Combined and Joint Operations, and, finally, Fundamentals of Alliance Military Doctrine and Standards.
- Additionally, respondents mentioned the following as overall high-priority training requirements: Unit/Collective Training; Training for Trainers; Training for International Operations (e.g., Operations Other Than War, Cultural Awareness, Peacekeeping, International Law); Leadership; Information Technology; General Public Education; and Training in Specialized Areas (Logistics, Air Defense, Basic Training, Procurement, Training for Reserves). There was agreement that ADL could, to some degree, support each of these areas with the possible exception of Unit/Collective Training.
- The respondents preferred Internet delivery of ADL materials rather than delivery by satellite or high bandwidth land-line. Despite its security issues, the Internet was seen as the most cost-effective and flexible alternative.
- The respondents preferred to develop ADL materials in cooperation with NATO, rather than depending on NATO to develop all materials or being left to develop ADL materials by themselves with just tools and advice from NATO. They emphasized the additional need for each country to remain free to develop its own ADL materials.
- The respondents preferred ADL materials to be distributed using a network of separate course libraries rather than using a single NATO library or separate national course libraries. Their comments emphasized the need for each country to maintain its own course libraries.
- The respondents reported that few or none of their ADL courses would be classified for security reasons.
- Ninety percent of the respondents reported that they directly supported the development of a NATO/PfP ADL capability. Their comments emphasized the importance of establishing ADL infrastructure and management before beginning substantial development efforts.

**THE 2003 SURVEY**

10. In 2003, the WG/IT&ED prepared and administered a second survey in response to the NTG tasking. This survey is the topic of this publication, and the findings reported here are based on responses it elicited. A copy of the WG/IT&ED 2003 Survey is included here as Enclosure 2.

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11. The 2003 Survey focused on needs and resources available in member and partner countries for ADL courses and performance aiding. As with the “Quick Look” survey, the time and resources needed for a carefully stratified, random, and representative sample of needs, priorities, and capabilities in each NATO/PfP nation were not available for the 2003 survey. However, it is unlikely that the high-level findings and consensus that emerged from this effort would be much altered by a more systematic approach.

**Findings**

12. Responses to the 2003 Survey were obtained from 20 countries. Some countries provided more than one response, yielding a total of 31 responses to the survey. Because this survey was intended to generate ideas and overall impressions, all these responses were weighed equally. Most of the responses were received from Land warfare communities (Army), but responses were also received from Air and Sea warfare communities, Ministries of Defense, and NATO and Service academies. They are included in the findings of this publication.

13. Respondents were asked to list the courses that use or plan to use ADL, to some extent, for their delivery. A total of 387 courses were listed. Of these:

- 255 were intended for officer professional development;
- 11 were intended for warrant officer professional development;
- 104 were intended for non-commissioned officer (NCO) professional development;
- 17 were intended for civilian professional development.

These data are doubtlessly incomplete, and participants in some of the courses may include officers, warrant officers, NCOs, and civilians alike. However the breadth of this coverage suggests a consensus that ADL approaches are suitable and appropriate for all professional military training and military personnel – they are not exclusively meant for officers, NCOs, or civilians alone.

14. Similarly, the courses covered a breadth of subject matter. Based on a rough categorization of all courses that are using or planning to use ADL approaches, Table 1 shows the percent of the total number of courses within each category:

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**Table 1. Percent of All ADL Courses Found Within Each Category.**

| <b>Course Categories</b>            | <b>Percent of All Courses Listed</b> |
|-------------------------------------|--------------------------------------|
| <b>Technical Training</b>           | <b>52</b>                            |
| <b>Basic Command and Control</b>    | <b>21</b>                            |
| <b>Training for Staff Positions</b> | <b>18</b>                            |
| <b>General Military Training</b>    | <b>5</b>                             |
| <b>Training for Trainers</b>        | <b>2</b>                             |
| <b>Language Training</b>            | <b>2</b>                             |

The table suggests a strong, but not exclusive, emphasis on the use of ADL approaches for technical training. Such instruction is by no means a minor component of professional military education and training. Still, these responses suggest that developers are finding ADL more amenable for presenting technical information than for less exact, more variable material.

15. The 2003 Survey asked “What percent of the course do you plan to conduct using ADL within three years?” The average overall percent (roughly, the time using ADL over total course time) reported by respondents was 65 percent. The percentages of times ranged from 5 to 100 percent. About 42 of the 387 courses (about 11 percent) were planned for 100 percent ADL presentation, but, overall, ADL was not expected to be the only approach used. Blended approaches involving a range of instructional techniques appear to be preferred.

16. In this regard, it is interesting to note that for an appreciable number of courses, roughly 10 percent, an ADL presentation is planned for use as a precursor, to prepare students to take courses in residence. The use of ADL presentations as preparation, supplement, or follow-on (sustaining or refresher training) for courses presented using other means may be a useful topic for subsequent WG/IT&ED surveys.

17. The 2003 Survey attempted to estimate what infrastructure would be available to support ADL approaches. More specifically, it asked respondents to estimate the percent of various locations, such as those shown in the rows of Table 2, that are expected to have ADL supporting capabilities, such as those shown in the columns of Table 2, within three years. Data limitations do not permit as full a report on this matter as might be suggested by Question 8 (shown in Enclosure 2). However the percentages shown in Table 2 appear to be sufficiently reliable to deserve mention.

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**Table 2. Percent of Locations with ADL Infrastructure Expected within Three Years.**

| <b>Location</b>                       | <b>Percent with Infrastructure Capability</b> |                      |                       |
|---------------------------------------|---|----------------------|-----------------------|
|                                       | <b>Email</b>                                  | <b>CD-ROM or DVD</b> | <b>World Wide Web</b> |
| <b>Military Schools and Academies</b> | <b>89</b>                                     | <b>84</b>            | <b>85</b>             |
| <b>Military Bases</b>                 | <b>88</b>                                     | <b>86</b>            | <b>83</b>             |
| <b>Military Offices</b>               | <b>80</b>                                     | <b>80</b>            | <b>80</b>             |
| <b>Homes of Military Personnel</b>    | <b>62</b>                                     | <b>62</b>            | <b>62</b>             |

The table suggests an all or none quality. If a location has one capability (e.g., email), it is likely to have others (e.g., CD-ROM drives). But the table also suggests that the full range of capabilities on which ADL depends is by no means everywhere available. It also suggests that expecting military personnel to be able to routinely access ADL material from their homes (in whatever spare time they can muster) may be overly optimistic.

18. The final issue addressed by the 2003 WG/IT&ED survey tried to rank the seriousness of obstacles to using ADL in conducting military education and training. The 26 obstacles or issues included in Survey Item 9 (shown in Enclosure 2) were grouped into 7 general categories:

- ADL Knowledge
- Infrastructure
- ADL Materials
- Learning Management Systems
- Student Services
- Expertise in Using ADL
- Resistance to ADL Use

The rank of each issue or obstacle, relative to all other issues and averaged across all respondents, is shown in Table 3. In the table, each issue is listed within one of the 7 general categories listed above for Survey Item 9. The average rank of each issue is based on the degree of difficulty, or seriousness of the obstacle, it presents to ADL use.

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**Table 3. Difficulty Ranks (1 = most difficult) of Issues in the Adoption of ADL**

| <b>General Category</b>                   | <b>ADL Issue</b>   | <b>Rank of 26<br/>(1 = most difficult)</b> |
|---|--|--|
| <b>Knowledge of ADL</b>                   | <b>Understanding of ADL by Military Commanders and School Administrators</b> | <b>5</b>                                   |
|   | <b>Understanding of ADL by Officers</b>                                      | <b>11</b>                                  |
|   | <b>Understanding of ADL by NCOs</b>  | <b>12</b>                                  |
| <b>Infrastructure</b>                     | <b>Cost of Hardware</b>  | <b>8</b>                                   |
|   | <b>Quality of Infrastructure</b>   | <b>9</b>                                   |
|   | <b>Cost of Infrastructure</b>  | <b>18</b>                                  |
|   | <b>Availability of Infrastructure</b>  | <b>19</b>                                  |
|   | <b>Availability of Hardware</b>  | <b>23</b>                                  |
| <b>ADL Materials</b>                      | <b>Availability of Development Expertise</b>                                 | <b>1</b>                                   |
|   | <b>Availability of ADL Materials</b>   | <b>4</b>                                   |
|   | <b>Cost of ADL</b>   | <b>6</b>                                   |
|   | <b>Quality of ADL Materials</b>  | <b>17</b>                                  |
| <b>Learning Management Systems (LMSs)</b> | <b>LMS Cost</b>  | <b>7</b>                                   |
|   | <b>LMS Quality</b>   | <b>24</b>                                  |
|   | <b>LMS Availability</b>  | <b>26</b>                                  |
| <b>Student Services</b>                   | <b>Cost to Provide Student Help</b>  | <b>13</b>                                  |
|   | <b>Availability of Help for Students</b>                                     | <b>21</b>                                  |
|   | <b>Protection of Student Privacy</b>   | <b>25</b>                                  |
| <b>Expertise in Using ADL</b>             | <b>Expertise of Military Instructors</b>                                     | <b>2</b>                                   |
|   | <b>Expertise of NCOs</b>   | <b>3</b>                                   |
|   | <b>Expertise of Officers</b>   | <b>10</b>                                  |
| <b>Resistance to ADL Use</b>              | <b>Resistance of Instructors</b>   | <b>14</b>                                  |
|   | <b>Resistance of Unit Commanders</b>   | <b>15</b>                                  |
|   | <b>Resistance of School Commanders and School Administrators</b>             | <b>16</b>                                  |
|   | <b>Resistance of NCOs</b>  | <b>20</b>                                  |
|   | <b>Resistance of Officers</b>  | <b>22</b>                                  |

There was an opportunity for respondents to enter other issues not covered in the survey. Five respondents mentioned an issue that can be stated in general as connectivity and the security of information networks. This issue may well be included in subsequent surveys.

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19. In terms of general categories, the two most difficult issue or obstacles in Table 3 appear to be the cost and availability of ADL materials and expertise in using them. Notably, the respondents rated limited expertise in using ADL as a much more serious obstacle than resistance or unwillingness of military personnel to use it. Also it is notable that although infrastructure to support ADL is a problem, it is not so much its availability or acquisition cost as it is the quality and the cost of using what is available that act as barriers to applying ADL in military education and training.

20. With regard to specific issues, the six issues or obstacles rated most difficult overall by the respondents, are:

- Availability of development expertise (most difficult);
- Expertise of military instructors;
- Expertise of NCOs;
- Availability of ADL materials;
- Understanding of ADL by military commanders and school administrators;
- Cost of ADL.

21. The six issues or obstacles rated least difficult overall by the respondents, listed in order of decreasing difficulty, are:

- Availability of help for students;
- Resistance of officers;
- Availability of hardware;
- LMS quality;
- Protection of student privacy;
- LMS availability (least difficult).

22. Although the respondents reported LMS cost as a substantial obstacle to the use of ADL, it is notable that they did not rate LMS quality or availability as major obstacles.

## **SUMMARY AND CONCLUSIONS**

23. Briefly summarized findings from this survey are:

- ADL approaches and materials are evidently considered suitable and appropriate across all echelons of military personnel. They are in use or planned for use by officers, warrant officers, non-commissioned officers, and civilian personnel.
- ADL approaches and materials are in use or planned for use across a wide range of subjects including technical training, basic command and control, training for staff positions, general military training, training for trainers, and language training.

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- Most ADL applications employ a blended approach in which some instructional material is presented using ADL materials and some is presented by conventional means in classrooms.
- Infrastructure capabilities needed to support ADL are available in military schools, academies, offices, and bases as well as in the homes of military personnel. However, such infrastructure availability is by no means universal. Possibilities for anywhere, anytime education, training, and performance aiding are increasing, but more infrastructure remains needed in a number of locations.

24. More information is needed on uses or planned uses of ADL for:

- Performance aiding;
- Preparation for residential instruction;
- Refresher or sustainment instruction following residential instruction;
- Supplemental instruction for residential instruction.

More information is also needed on:

- Opportunities for increasing the availability of development expertise;
- Opportunities for reducing the cost and availability of ADL materials;
- Opportunities for increasing expertise in using ADL.

These issues may be covered in subsequent WG/IT&ED surveys.

25. Along with the Quick Survey reported in 2002, it seems equally appropriate to conclude that the importance and military value of ensuring that education, training, and performance aiding are available anytime and anywhere they are needed is widely recognized and accepted. ADL seems to be a reasonable approach to make this happen.

## **REFERENCES**

WG/IT&ED (2002). Advanced Distributed Learning Quick Survey Results: 2002 Report. NATO Training Group Working Group on Individual Training and Educational Developments.

Dodds, P. V. W., & Fletcher, J. D. (2004). Opportunities for new “smart” learning environments enabled by next generation web capabilities. Journal of Education Multimedia and Hypermedia, 13(4).

Fletcher, J. D., & Johnston, R. (2002). Effectiveness and Cost Benefits of Computer-Based Aids for Maintenance Operations. Computers in Human Behavior, 18, 717-728.

Spohrer, J., Sumner, T. & Shum, S.B. (1998). Educational authoring tools and the educational object economy: Introduction to the special issue from the East/West group.

**NATO/PfP UNCLASSIFIED**  
**DRAFT**

Journal of Interactive Media in Education (<http://www-jime.open.ac.uk/98/10/spohrer-98-10-paper.html>).

Wiley, D. (2000). The Instructional Use of Learning Objects. On line at <http://www.reusability.org/read>.

WG/IT&ED (2002). Advanced Distributed Learning Quick Survey Results: 2002 Report. NATO Training Group Working Group on Individual Training and Educational Developments.

Wisher, R. A., & Fletcher, J. D. (2004). The case for advanced distributed learning, Information & Security: An International Journal, 14, 17-25.